

Hi.. This is Abhishek Sharma... I am doing this stuff as my vacations practice... & ... Also to know more & more from Internet about any topic (Related to my stream)....So, in that manner I'm on verge to create the project on "CLOUD COMPUTING"... Sounds much heavy word isn't it ,hmmm.... I was also had the same feeling about it in the beginning ... but believe me there is not any thing like that , CC , is very awesome & also very great thing & It'll change the world forever.. Even I'm feeling Myself very lucky Cuz I am able to create my project on CC today BCoz It is yet not very much popular nowadays , because of less interest by the people & also Coz it is in developing stage... here I'm going to explain the CC..

Best of Luck to me.....

Cloud Computing(CC) Also known as **UTILITY COMPUTING..**

Cloud Computing

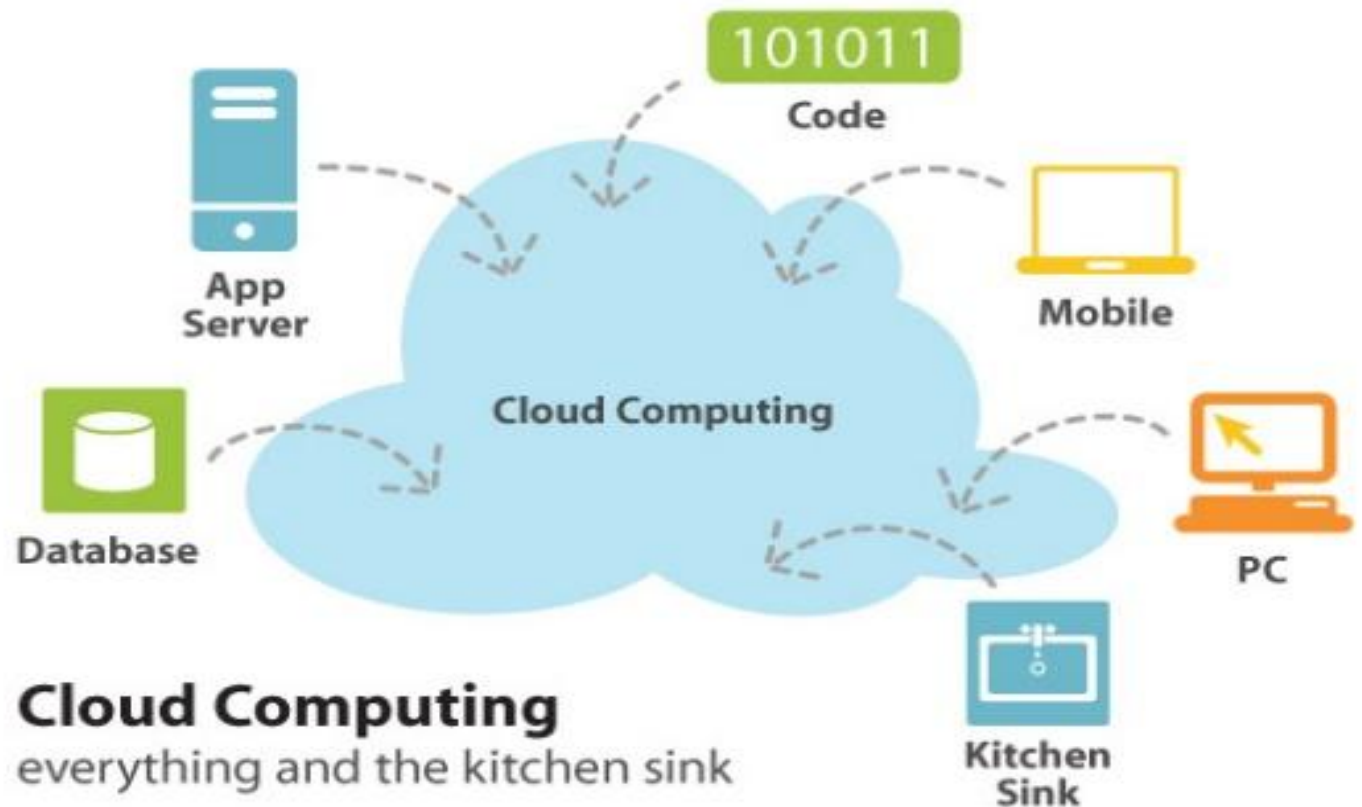
After doing a lot of search I've found that there is not any suitable definition which can we do cram , SO by the example & practice we can get What actually the CC is.. The most important about CC as I do think is divided into two forms ..As discussed below..

1.. Cloud computing, an internet based computing where software, shared resources and information are served to devices such as computers, electricity grid. In this details about how the work is getting done is hidden from its users. It describes a new consumption, delivery and supplement model for IT services. It is kind of by-product that provide access to remote sites accessible through internet. Practically applications area of cloud computing not limited.

2.. Cloud computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing storage, memory, processing and bandwidth.

A simple example of cloud computing is Yahoo email or Gmail etc. You dont need a software or a server to use them. All a consumer would need is just an internet connection and you can start sending emails. The server and email management software is all on the cloud (internet) and is totally managed by the cloud service provider Yahoo , Google etc. The consumer gets to use the software alone and enjoy the

benefits. The analogy is , 'If you only need milk , would you buy a cow ?' All the users or consumers need is to get the benefits of using the software or hardware of the computer like sending emails etc. Just to get this benefit (milk) why should a consumer buy a (cow) software /hardware ..



Computing on The Cloud...

The Cloud in the CC provides the means through which everything – from computing power to computing infrastructure , business processes to personal collaboration , can be delivered to u as a service wherever & whenever u need ...

Defining the “Cloud”

The Cloud itself is a set of hardware ,network, storage & interface that enables the delivery of computing as a service. CLOUD SERVICE include the software , infrastructure & storage over the internet based on ur demand.

The word “Cloud” has a lot of participants ::

- **End user** :: The end user doesn't really have to know anything about the underlying technology .
- **Business Management** :: It needs to take responsibility of overall governance of data or services lying on the clouds. Cloud service provider must provide guaranteed service levels & security to all their constituents.
- **Cloud Service provider**:: It is responsible for “ IT “ assets & maintenance.

The World of Cloud Computing...

There are many players that create The cloud World For CC..

- **Vendors** :: These provide the Applications & enabling Technology, Infrastructure, Hardware & integration.
- **Partners** :: These are those Vendors That are creating Cloud services offerings & providing support services to users.
- **Business Leaders** :: These are those who are either using or evaluating various types of cloud computing offerings.

Where is the Cloud...?

An agency can host a Cloud itself, subscribe to a cloud service hosted by another agency, or, subscribe to a Third party service provider. Some agencies subscribe to an external for some service & build a private cloud for others , depending upon criticality & security classification of the service .

The Idea of Cloud computing ::

The concept is very simple: On your desk, you would have a very low-cost computer with just a processor, a keyboard and a monitor. There would be no [hard drive](#) or [CD/DVD drive](#). It would be hooked up to the [Internet](#) and would link to a central supercomputer, which would host all of your programs and files...

Why cloud...?

- ❖ Processing 1000x more data doesn't have to be 1000x times harder.
- ❖ Cycles & bytes , not hardware , are the new commodities.
- ❖ To address Scalability & availability concern for large scale application.
- ❖ Democratized distributed computing.

Need of Cloud Computing...

Cloud computing deals any subscription-based or pay-per-use service that, in real time over the Internet, extends IT's existing capabilities. Cloud computing technology provides on-the-fly, point-and-click customization and report propagation for business users, so IT doesn't spend half its time making minor changes and running reports.

Cloud computing technology is tripping a huge change in application development circles. As a metaphor for the Cyberspaces, "the cloud" is a everyday cliché, but when combined with "computing," the meaning gets large and furrier. Today, for the most part, IT must jade into cloud-based services individually, but cloud figuring aggregators and integrators are already emerging. One potential security implication of cloud computing is that if you have individual data in that cloud, you are sharing hardware/networks with potential competitors in rather close propinquity, which is why for some folks building "clouds" they look to be for the most part just virtualization-heavy internal deployments. Cloud-based tools can be up and working in a few days, which is silent of with sanctioned business software.

Increasingly, IT squads are turning to cloud computation technology to minimize the time spent on lower-value natural actions and allow IT to focus on essential activities with greater impact on the business.

The cloud computing infrastructure not only provides deep customization and application configuration, it preserves all those customizations even during upgrades. By their very nature, cloud figuring technology is much better and quicker to incorporate with your other enterprise applications (both sanctioned software package and cloud computation infrastructure-based), whether third-party or homegrown.

By eliminating the problems of traditional application development, cloud computing technology releases you to focus on developing business applications that deliver true value to your business (or your customers).

The Working of Cloud Computing ::

To understand how does cloud computing work, imagine that the cloud consists of layers — mostly the **back-end** layers and the **front-end** or user-end layers. The front-end layers are the ones you see and interact with. When you access your email on Gmail for example, you are using software running on the front-end of a cloud. The same is true when you access your Facebook account. The back-end consists of the hardware and the software architecture that fuels the interface you see on the front end.

Because the computers are set up to work together, the applications can take advantage of all that computing power as if they were running on one particular machine. Cloud computing also allows for a lot of flexibility. Depending on the demand, you can increase how much of the cloud resources you use without the need for assigning specific hardware for the job, or just reduce the amount of resources assigned to you when they are not necessary.



Types of Cloud computing

Cloud computing is typically classified in two ways:

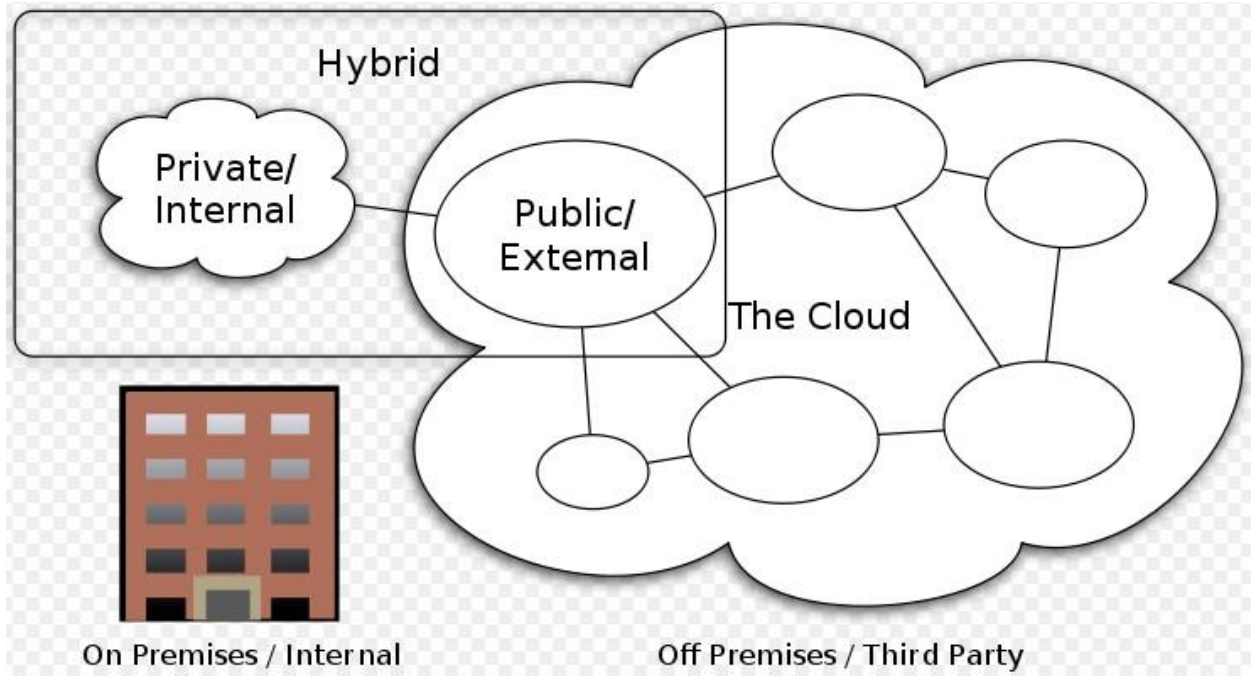
1. *Location of the cloud computing.*
2. *Type of services offered.*

Location of the cloud

Cloud computing is typically classified in the following three ways:

1. ***Public cloud***: In Public cloud the computing infrastructure is hosted by the cloud vendor at the vendor's premises. The customer has no visibility and control over where the computing infrastructure is hosted. The computing infrastructure is shared between any organizations.
2. ***Private cloud***: The computing infrastructure is dedicated to a particular organization and not shared with other organizations. Some experts consider that private clouds are not real examples of cloud computing. Private clouds are more expensive and more secure when compared to public clouds.

Private clouds are of two types: On-premise private clouds and externally hosted private clouds. Externally hosted private clouds are also exclusively used by one organization, but are hosted by a third party specializing in cloud infrastructure. Externally hosted private clouds are cheaper than On-premise private clouds.



3. **Hybrid cloud** Organizations may host critical applications on private clouds and applications with relatively less security concerns on the public cloud. The usage of both private and public clouds together is called hybrid cloud. A related term is Cloud Bursting. In Cloud bursting organization use their own computing infrastructure for normal usage, but access the cloud for high/peak load requirements. This ensures that a sudden increase in computing requirement is handled gracefully.
4. **Community cloud** involves sharing of computing infrastructure in between organizations of the same community. For example all Government organizations within the state of California may share computing infrastructure on the cloud to manage data related to citizens residing in California.

Classification based upon service provided

Based upon the services offered, clouds are classified in the following ways :

1. **Software as a service (SaaS)** includes a complete software offering on the cloud. Users can access a software application hosted by the cloud vendor on pay-per-use basis. This is a well-

established sector. The pioneer in this field has been Salesforce.coms offering in the online Customer Relationship Management (CRM) space. Other examples are online email providers like Googles [gmail](#) and Microsofts [hotmail](#), [Google docs](#) and Microsofts online version of office called [BPOS](#) (Business Productivity Online Standard Suite).

2. Hardware as a service (HaaS) This is where computing producing capacity is purchased over web. This is also very much important of the CC.. This can be further divided into two parts . i.e. ***IaaS and PaaS..***

- ***Infrastructure as a service (IaaS)*** involves offering hardware related services using the principles of cloud computing. These could include some kind of storage services (database or disk storage) or virtual servers. Leading vendors that provide Infrastructure as a service are [Amazon EC2](#), [Amazon S3](#), [Rackspace Cloud Servers](#) and [Flexiscale](#).
- ***Platform as a Service (PaaS)*** involves offering a development platform on the cloud. Platforms provided by different vendors are typically not compatible. Typical players in PaaS are [Google's Application Engine](#), [Microsoft's Azure](#), Salesforce.com's [force.com](#) .

SaaS (Software as a Service)	PaaS (Platform as a Service)	IaaS (Infrastructure as a Service)
Applications, typically available via the browser: <ul style="list-style-type: none">• Google Apps• Salesforce.com	Hosted application environment for building and deploying cloud applications: <ul style="list-style-type: none">• Salesforce.com• Amazon E2C• Microsoft Azure	Utility computing data center providing on demand server resources: <ul style="list-style-type: none">• HP Adaptive Infrastructure as a Service• Rackspace• Amazon E2C & S3

SaaS is the strongest Cloud trend and Service

The below classification is also well accepted in the industry.....

1. Storage-as-a-service
2. Database-as-a-service
3. Information-as-a-service
4. Process-as-a-service
5. Application-as-a-service
6. Platform-as-a-service
7. Integration-as-a-service
8. Security-as-a-service
9. Management/Governance-as-a-service
10. Testing-as-a-service.

Characteristics of Cloud Computing ::

- ***Pay per use***
- ***No long term Commitment***
- ***No hardware/Software require to install***
- ***Dynamic allocation & Movement of apps***
- ***O/S Architecture independent***
- ***Global Availability of Data.***

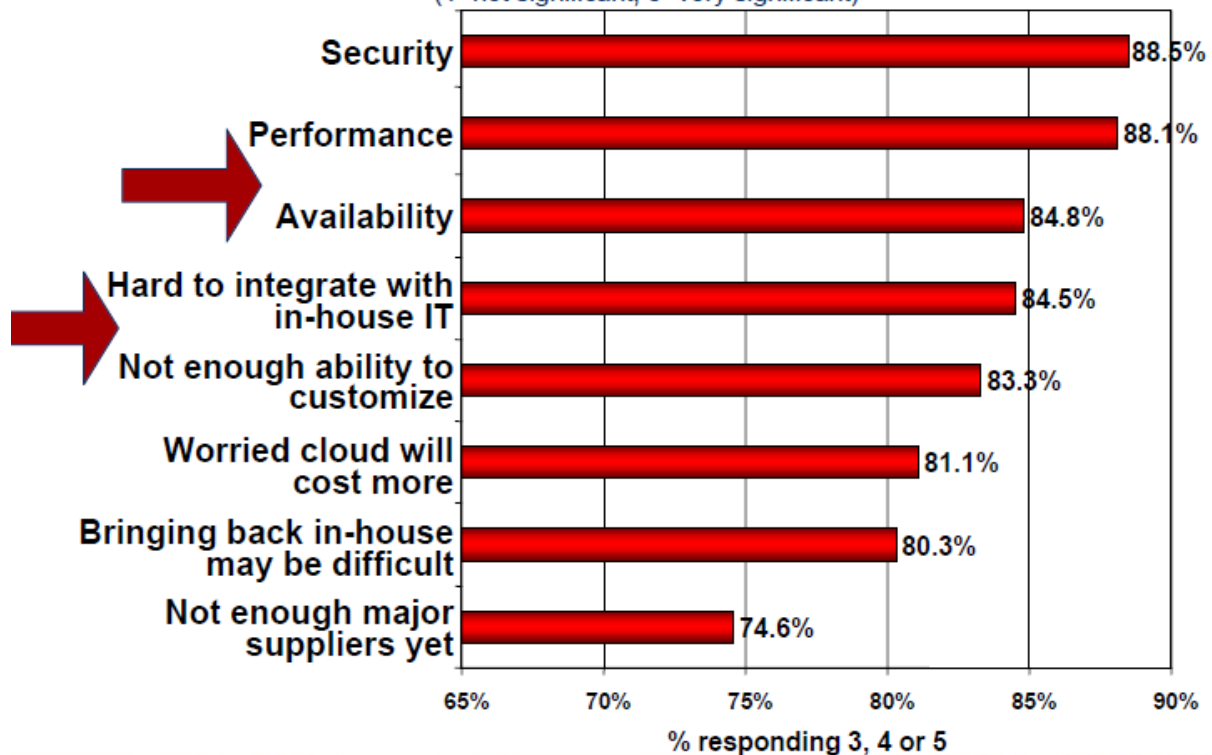
The Risk while floating in the Clouds...

Rather CC has tremendous benefits to everyone i.e. to Individual, To small enterprise, & also to large enterprise but It has very bigger & very sensitive problem about the security & the safety of data frm Service providers & also frm Crackers. Cuz in nowadays the biggest problem in CC is the Cracking of data by hackers & Crackers. But some of the companies are providing full security about their user's data yet The user has suspect in their minds about their Data's safety.. &.. it is the biggest concern in the CC , Which cannot be neglected by companies..The Risk occurs while using Clouds are...

- ✚ If ur Cloud service provider hasn't done good job by securing it's own environment , then the user will be in great trouble.*
- ✚ IT security is difficult to monitor & problem may not be apparent until something goes wrong.*
- ✚ Measuring the quality of a provider's approach to security is much difficult Because many Cloud Providers don't expose their infrastructure to their customers.*
- ✚ Including the performance & availability levels that a business require to successfully operate. This Include the notifications & alert plans if something goes wrong.*

What User's are Concern about with Cloud Computing.

Q: Rate the **challenges/issues** of the 'cloud'/on-demand model
(1=not significant, 5=very significant)



Benefits of Cloud Computing.

- *Reduced Costs*
 - *Cost of development & maintenance*
- *Access to increased/decreased resources*
 - *Occasional or limited use Scenario*
- *Flexibility*
- *Mobility – Access any where & everywhere*
- *Automation & Shifting Administration to others.*

Advantages Of Cloud Computing.

- ∂ *Saves costs & economy of Scale*
- ∂ *Highly scalable*
- ∂ *Speed Innovations*
- ∂ *Easy to deploy new services to global market*
- ∂ *Virtual Portability of data*

Disadvantages of Cloud Computing.

- ∂ *User will not be in full control of data*
- ∂ *User must be online to access to his/her data*
- ∂ *Depended on Provider to access data*
- ∂ *Data Privacy*
- ∂ *Censorship & Human rights*

Who are using Cloud computing Today ..?

Rather we all are using CC in many ways i.e. By using E-mails services & By using torrent Services & by many more ways, but these all are Individual users of CC service. So the major Service Users are::

- ◆ *Startup & Small Businesses.*
- ◆ *Mid-size Enterprises.*
- ◆ *Large Enterprises.*

Platforms:

Many of the companies that started out providing On Demand application services have developed platform services as well. The platform segment of cloud computing refers to products that are used to deploy internet. Net Suite, Amazon, Google, and Microsoft have also developed platforms that allow users to access applications from centralized servers.

In July 2008, [HP](#), [Yahoo! \(YHOO\)](#), and [Intel \(INTC\)](#) announced a joint cloud computing research project called the Cloud Computing Test Bed. The companies are jointly designing and producing the internet based testing utilizing HP hardware and Intel processors.^[4]

- **Active platforms** - The following companies are some that have developed platforms that allow end users to access applications from centralized servers using the internet. Next to each company is the name of their platform.
 - [Google \(GOOG\)](#) - Apps Engine
 - [Amazon.com \(AMZN\)](#) - EC2
 - [Microsoft \(MSFT\)](#) - Windows Azure
 - [SAVVIS \(SVVS\)](#) - Symphony VPDC
 - [Terremark Worldwide \(TMRK\)](#) - The Enterprise Cloud

- [Salesforce.com \(CRM\)](#) - Force.com
- [NetSuite \(N\)](#) - Suiteflex
- [Rackspace Cloud](#) - cloudservers, cloudsites, cloudfiles
- [Metrisoft](#) - Metrisoft SaaS Platform
- [\[1\]](#) - SUN Oracle direct link
- Cordys Process Factory - The Enterprise Cloud Platform.

Some of the major player's in Cloud Computing..With Little knowledge.

Amazon Elastic Compute Cloud (Amazon EC2)



Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers.

Amazon EC2's simple web service interface allows you to obtain and configure capacity with minimal friction. It provides you with complete control of your computing resources and lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change. Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use. AmazonEC2 provides developers the tools to build failure resilient applications and isolate themselves from common failure scenarios.

Features of Amazon Ec2...

Amazon Elastic Block Store □ Amazon Elastic Block Store (EBS) offers persistent storage for AmazonEC2 instances. Amazon EBS volumes provide off-instance storage that persists independently from the life of an instance. Amazon EBS volumes are highly available, highly reliable volumes that can be leveraged as an Amazon EC2 instance's boot partition or attached to a running Amazon EC2 instance as a standard block device.

Reliable □ Amazon EC2 offers a highly reliable environment where replacement instances can be rapidly and predictably commissioned. The service runs within Amazon's proven network infrastructure and datacenters. The Amazon EC2 Service Level Agreement commitment is 99.95% availability for each Amazon EC2 Region.

Secure □ Amazon EC2 provides numerous mechanisms for securing your compute resources. Amazon EC2 includes web service interfaces to configure firewall settings that control network access to and between groups of instances.

Elastic □ Amazon EC2 enables you to increase or decrease capacity within minutes, not hours or days. You can commission one, hundreds or even thousands of server instances simultaneously. Of course, because this is all controlled with web service APIs, your application can automatically scale itself up and down depending on its needs.



Windows Azure™ is a cloud services operating system that serves as the **development, service hosting and service management environment** for the Windows Azure platform. Windows Azure provides developers with on-demand compute and storage to host, scale, and manage web applications on the internet through Microsoft® datacenters.

Windows Azure is a flexible platform that supports multiple languages and integrates with your existing on-premises environment. To build applications and services on Windows Azure, developers can use their existing **Microsoft Visual Studio®** expertise. In addition, Windows Azure supports popular standards, protocols and languages including SOAP, REST, XML, Java, PHP and Ruby. Windows Azure is now commercially available in 40 countries.

Application Scenarios:

Windows Azure is a service that allows developers to run applications and store data on servers owned and operated by Microsoft. These cloud applications can be targeted at businesses, consumers or both. Some examples are:

- Enterprises that use Windows Azure to run their own line-of-business, batch processing or large-volume computations.
- An independent software vendor (ISV) that creates a SaaS application targeted towards business users.
- Perform large-volume storage, batch processing, intense or large-volume computations
- An ISV that creates a SaaS application targeted towards consumers.

You can find some example Windows Azure customer and partner success Stories [here](#).

Benefits:

- *Agility*: Take advantage of development tools, automated service management and global datacenter presence to respond faster to customer needs, focus on your competitive differentiators, and reach new markets.
- *Efficiency*: Windows Azure improves productivity and increases operational efficiency by lowering up-front capital costs. Customers and partners can realize a reduction in Total Cost of Operations of some workloads by up to 30 – 40% over a 3 year period . The consumption based pricing, packages and discounts for partners lower the barrier to entry for cloud services adoption and ensure a predictable IT spend. See Windows Azure pricing.

- *Focus*: Focus on delivering services and value to your customers – and not on managing technology infrastructure. Windows Azure enables you to spend less time on operational hurdles and more time focusing on your competitive differentiators.
- *Simplicity*: Utilize your existing skills in familiar languages such as .NET, Java and PHP to create and manage web applications and services.
- *Trustworthy*: Enterprise class service backed by a reliable service level agreements and a rich online services experience.

Google Apps Engine



Google App Engine lets you run your web applications on Google's infrastructure. App Engine applications are easy to build, easy to maintain, and easy to scale as your traffic and data storage needs grow. With App Engine, there are no servers to maintain: You just upload your application, and it's ready to serve your users.

The Application Environment

Google App Engine makes it easy to build an application that runs reliably, even under heavy load and with large amounts of data. App Engine includes the following features:

- dynamic web serving, with full support for common web technologies
- persistent storage with queries, sorting and transactions
- automatic scaling and load balancing
- APIs for authenticating users and sending email using Google Accounts
- a fully featured local development environment that simulates Google App Engine on your computer
- task queues for performing work outside of the scope of a web request
- scheduled tasks for triggering events at specified times and regular intervals.

These all are service provider.. but these are for developers so best & known example of CC is our E-Mail host server like yahoo.com, Gmail.com,hotmail.com, AOLmail.com etc. These are for individuals

The one of the most Important & very Innovative Form of Cloud Computing is “Cloud Gaming” ...

What is Cloud gaming.. It is the same process , to play online Games without having game's console like game's setup etc. just go to the service provider or website pay for the service & play the game.. i.e. no need to purchase the game & other stuff...

Cloud gaming ...

Cloud gaming is a type of [online gaming](#) that allows direct [streaming](#) of games onto a computer through the use of a [thin client](#), in which the actual game is stored on the game company's [server](#) and is streamed directly to computers accessing the server through the client. This allows access to games without the need of a [console](#) and largely makes the [capability](#) of the user's computer unimportant, as the server is the system that is running the processing needs. The controls and button presses from the user are transmitted directly to the server, where they are recorded, and the server then sends back the game's response to the input controls. This process works swiftly, with "less than a millisecond of lag, allowing for an almost seamless gaming experience." Furthermore, a low-level internet connection will also work with the server connection, with only a "DSL connection of 1.5 mbps" needed for a [standard-definition television](#).

Biggest player in Cloud gaming...

Onlive.com



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OnLive is a [cloud computing](#), [gaming-on-demand](#) platform: the games are synchronized, rendered, and stored on remote [servers](#) and delivered via the [Internet](#).

The service is available using the OnLive Game System, PCs running [Microsoft Windows](#) (7, Vista, XP) and [Intel](#)-based [Macs](#) with [OS X](#) 10.5.8 or later. A low-end computer, as long as it can play video, may be

used to play any kind of game since the game is computed on the OnLive server. For that reason, the service is being seen as a competitor for the console market. All games on the service are available in [720p](#) format and to play in [high-definition](#). On Live recommends an Internet connection of 5 Mbit/s or faster, and a 3 Mbit/s connection meets the minimum system requirements. The average broadband connection speed in the US at the end of 2008 was 3.9 Mbit/s, while 25% of US broadband connections were rated faster than 5 Mbit/s.

That's What I've created a project on Cloud Computing.. I do think That I've tried my best to touch all the majors as well as minor concepts of cloud Computing...Thanxx ..To Internet ,Cuz without it's help I was unable to make this project.. Thanxx once again...

*Created By Abhishek Sharma...From **India***

Created on 12-jan-2011..

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Thanxx.....to all... & Gud Luck ... bye bye....